HANDCUF

FOR

ALCOHOLIS

1890.

Price : Single copy 25 cts.—50 copies $7.
Address the author : Rev. George Zurc
Buffalo Plains, Erie C

TO

ARCHBISHOP IRELAND,

THE ILLUSTRIOUS APOSTLE AND PROPHET,

IN THE NOBLE CAUSE

WHICH IS DESTINED TO PROTECT BOTH RELIGION AND AMERICAN LIBERTIES AGAINST THE RAVAGING ONSLAUGHTS OF ALCOHOLISM,

THE FOLLOWING PAGES ARE RESPECTFULLY DEDICATED, BY

THE AUTHOR.

EXTRACTS FROM ARCHBISHOP IRELAND'S LETTERS TO THE AUTHOR :

St. Paul, Minn., March 1, 1890.

I mail you to-day the first part of your proof. . . . . I am quite honored that you think of dedicating your book to me. What I have read is really excellent, and takes ground that gives a good foundation to the whole thesis. It is well to persuade men that their health is impaired by alcohol.

St. Paul, Minn., March 5, 1890.

I return the second instalment of your proof. . . . . The more I read of your work, the more I am satisfied that it will do a great deal of good. . .

Sincerely,

✠ *JOHN,*

Archbishop of St. Paul.

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INTRODUCTION.

THE yearning for the deliverance from the disastrous and far-reaching evils engendered by the prevalent abuse of alcoholic beverages, is general and imperious. But it is becoming more and more apparent that every isolated attack against the giant evil of intemperance must end in failure. The ecclesiastical, the secular and the natural law have successively grappled with it, with a success which has invariably fallen short of reasonable expectations. The only possible and satisfactory solution of the liquor problem must result from the combined efforts of all the friends of temperance, however heterogenous may be their scientific, political, and religious views.

It is the duty of science to formulate the solution of the difficulty. The drinking habits of former generations and of nations living in other climates, are more or less injurious to the American people. Alcohol exercises a stronger influence upon our nerves than upon the nerves of other nations. It is quite universally conceded that we are more nervous than the inhabitants of other parts of the globe. We have to fight against diseases the nomenclature of which is quite American. Our climate is radically different from any other. We use about 30 per cent more solid food than the people in Europe. The experience of past ages is at our disposal, it is true ; but in many things we are a singular and lonely people. And for this reason, we are often thrown upon our own sagacity and resources. As Washington and his contemporaries founded a government without precedent, so are we compelled to solve the liquor question without finding, in the history of mankind, a single precedent to decide for us as to what extent alcohol is beneficial to health. However, calm and

patient scientific researches will force upon us the conclusion that the habitual use of any kind of alcoholic beverage is more injurious than beneficial in America.

Science must take the first practical step towards a successful temperance movement in America. It must build a solid platform upon which the leaders of the friends of temperance may consistently take their stand. The next important step will be to enroll the Catholic Church among the combatants. Unity of purpose and harmony of methods are two qualities which are indispensable in any prolonged contest, and which the Catholic Church alone can communicate to all the friends of temperance in the approaching warfare against Alcoholism. Victory, though perhaps yet remote, will be assured from the moment that the Catholic Church throws herself into the fight. Her clergy are the most invincible moral phalanx on earth. Any cause which gets their hearty support is sure of success. Having no relatives or friends for whom they are obliged to provide on earth, they can devote their lives and energies to a

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Carbon is the real poisonous element in alcohol; because carbon invariably acts as a poison when retained in the blood. There is absolutely nothing to warrant the general belief that some alcohols are pure. The purest alcohol contains two parts of carbon to one of oxygen. The inferior grades of alcohol contain more carbon. Fusel oil, the lowest grade of drinkable alcohol, contains five parts of carbon to one of oxygen.

There are four kinds of drinkable alcohols: The ethylic, the propylic, the butylic, and the amylic. The ethylic or so-called pure alcohol, or French spirit, contains carbon, hydrogen, and oxygen, in the following proportion: C_2 H_6 O_1, or:

Ethylic or "pure alcohol," or French spirit:	Carbon Carbon Hydrogen Hydrogen Hydrogen Hydrogen Hydrogen Hydrogen Oxygen

Ethylic alcohol is derived from sugar, starch, fruits, and grains. It is "pure" in the sense that it contains less carbon than the other alcohols. After it is extracted, an inferior alcohol is yet obtained from the same raw materials. This is the propylic alcohol · it contains $C_3 H_8 O_1$, or :

Propylic alcohol :
- Carbon
- Carbon
- Carbon
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Oxygen

Butylic alcohol, which is generally derived from beets, contains $C_4 H_{10} O_1$, or :

- Carbon
- Carbon
- Carbon

Butylic alcohol:
- Carbon
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Hydrogen
- Oxygen

Amylic alcohol is obtained from potatoes and from sugar, starch, fruits, and grains, after the lighter and better alcohols have been extracted from these substances. It is the lowest grade of drinkable alcohol. It is sometimes called fusel oil. It contains $C_5 H_{12} O_1$. or:

- Carbon
- Carbon
- Carbon
- Carbon
- Carbon
- Hydrogen

Amylic alcohol or fusel oil :	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Hydrogen
	Oxygen

The alcohols which contain more carbon than the amylic, cease to be liquid. They are sticky, and, therefore, not drinkable.

When the better grades of alcohol are ignited with a flame, the carbon of the alcohol unites with the oxygen of the atmosphere, and is completely burned up. In the burning of amylic alcohol, only a portion of the carbon can unite with the surrounding oxygen ; the remainder of the carbon passes off in the form of smoke or soot. Soot is nearly pure carbon.

For the same reason, alcohol is least injurious to those who follow out-door

pursuits and avocations. The carbon which alcohol throws into the blood, has to be removed by the oxygen of the air we inhale. Oxygen is more abundant outside than inside of houses. The outdoor atmosphere, therefore, is the most favorable to the removal of alcoholic poison from the blood

CHAPTER II.

FRENCH SPIRIT.

Latest invention for making French spirit. How it is prepared for consumption. The adulterations of liquors are quite harmless.

FRENCH spirit or ethylic alcohol used to be extracted, exclusively, from the sugar of grapes. But, lately, the science of distillation has been enriched by such important discoveries that the inferior alcohols can, henceforth, be purified from a portion of their carbon, and converted into pure or ethylic alcohol. The principal difference between the higher and the lower grades of alcohol is, that the latter contains more carbon than the former. It was to be expected that

human ingenuity would soon find out some method of removing a portion of carbon from the inferior alcohols. This is accomplished by the system of compound distillation, invented by Savalle, in France, and by Blumenthal and Berlien, in Germany. Potato alcohol or fusel oil can now be "rectified" until it becomes identical with grape or grain alcohol. In France, there is a beet distillery which produces, in one day, 7,392 gallons of French spirit.[1] This means, that the alcohol which is derived from beet sugar, is as pure as the rum which is produced by cane sugar, or the brandy which is furnished by grape sugar.

Until recently, the volatile oils which were allowed to pass in distillation into alcohol, added a distinctive flavor to the different brands of alcohol. This volatile oil of the grape, for instance, produces a peculiar flavor in the alcohol extracted from the sugar of grapes. But a new process of flavoring is now in vogue. Recti-

[1] Raw Materials, Distillation, and Rectification, p. 119. London and Philadelphia, 1885.

fication removes from alcohol the flavoring oils together with the unnecessary carbon. All kinds of alcohol are brought to a common standard. After rectification, which converts them into French spirit or pure ethylic alcohol, they are absolutely alike.

This French spirit requires more or less treatment before it is ready for consumption. It contains from 90 to 97 per cent absolute alcohol, and from 3 to 10 per cent water. To prevent it from severely irritating the mucous membranes of the throat, it must be diluted with water until it contains no more than from 40 to 50 per cent alcohol. It must then be flavored to suit the tastes of the consumers. Thus, the flavor of Armagnac cognac may be imparted to any pure ethylic alcohol, in the following manner: "Add to 26 gallons of pure spirit, besides the necessary water, 2 pints of infusion of nut shells, 4 pints of infusion of bitter almond shells, and 6 pints of glucose."[1] The following receipt is more complicated, and should

[1] Ibid, p. 256.

not fail to soothe the palate of cognac sippers: "To 14 gallons of rectified spirit of 85 per cent, add 8 gallons of water, 4 pints of ordinary rum, 4 pints of glucose, 17 ozs. of dried liquorice, 2 ozs. of black tea, 30 grains of cream of tartar, 15 grains of boracic acid. Color with burnt sugar."[1] The following imitation of gin has been pronounced genuine, by good judges: "To 20 gallons of pure spirit, besides the necessary water, add 1½ pints of syrup, ½ oz. of acetic acid, ½ pint of lemon juice, 1½ lbs. of juniper berries, 1 drachm of pure turpentine, and 2 drachms of fennel seed."[2] Scotch whiskey is produced thus: "To 20 gallons of pure spirit, add, besides water, 4 gallons of Scotch whiskey, 30 drops of creosote, ½ oz. of acetic acid, and 1 pint of syrup."[3]

Fancy liquors require a greater variety of flavoring substances. Absinth, for instance, is the result of the following mixture: "To 25 gallons of pure spirit, add, besides water, 5 lbs. of large wormwood, dried, 13 lbs. of green anice seed, 8 lbs. of

[1] Ibid, p. 257. [2] Ibid, p. 262. [3] Ibid, p. 262.

Florence fennel, and 2 lbs. of coriander seed. For coloring green, add 26 ozs. of hyssop, 25 ozs. of dry Moldavian balm, and 2 lbs. of small wormwood."[1] Caraway seed, lemon peel, orange blossoms, cloves, vanilla, bitter almonds, roses, calamus root, cinnamon, nut shells, roasted coffee, etc., when judiciously mixed with French spirit, may produce an unlimited variety of liquors.

With the exception of creosote, strichnine, and other poisons which are sometimes added to alcoholic liquors, the flavoring substances are rather harmless, when used in small quantities. Therefore, the adulteration of liquor, as a cause of disease, is of no great consequence. It must also be confessed, that fusel oil or amylic alcohol, on account of the increasing facilities for producing French spirit, is being more and more eliminated from the consumption of intoxicating liquors. It will be used, henceforth, rather for mechanical than for drinking purposes. Therefore, the whole question as to how far

[1] Ibid, p. 267

spirituous liquors are injurious to health, reduces itself to this: What effects are produced by the carbon of pure alcohol, when introduced into the human system?

Among the many unsolved problems which confront medical science, there is none more interesting and more important than this: To what extent is carbon a factor in the production of disease? If science can furnish an accurate answer to this question, it will be easy to determine the deleterious effects of alcohol upon animal life.

CHAPTER III.

ALCOHOL CARBONIZES THE BLOOD.

The process of the oxygenation of the blood is retarded by alcohol. An accumulation of carbon is the result. How carbon produces death.

ALCOHOL is an indigestible substance. After its introduction into the stomach, it is rapidly being transmitted into the blood-vessels. "In one of Dr. Percy's experiments, in which the animal died two minutes after the injection of alcohol into its stomach, the blood was found strongly impregnated with alcohol, and the stomach was nearly void."[1] Once circulating with the blood,

[1] Quoted in Carpenter's Effects of Alcohol, p. 84. Philadelphia, 1866.

alcohol finds its way to the brain, to the lungs, to the kidneys, and to any other part of the body. It is generally decomposed in the blood; its carbon unites with the oxygen of the blood, and forms carbonic acid, which is exhaled by the lungs. Carbon cannot be exhaled as such; it must first be oxygenized, or transformed into carbonic acid. As long as the carbon produced in the blood by the decomposition of alcohol, is speedily taken up by the oxygen of inhaled air, and exhaled as carbonic acid, it is certain that alcohol, besides its immediate effects upon the nerves, the veins, and the heart, cannot be very harmful. But, whenever the supply of oxygen is inadequate for the transformation of carbon into carbonic acid, there must be an accumulation of carbon in the blood, because oxygen is the only available substance which can transform the carbon in the blood into carbonic acid. Boiling nitric acid transforms it; but it is not likely that the blood of a living person ever contains boiling nitric acid. Alkalies, at ordinary temperatures, and the strongest heat at

tainable in furnaces, do not affect carbon. "Pieces of charcoal (carbon) are found enclosed in the cinders of blast furnaces, which have been, for twenty-four hours or more, in the intense heat of its interior, among melting ores and limestones, but protected, in some way, from exposure to the oxygen of the blast."[1] Therefore, when the carbon present in the blood does not encounter a sufficient quantity of oxygen, it cannot be readily eliminated from the blood. It must accumulate, or lodge in the kidneys, in the liver, or in some other organ, where it is apt to produce fatty degeneration and other derangements.

Every waste substance, when unduly retained in the system, acts as a poison. Carbon in the blood is a waste substance; and, when it is unduly retained, it acts as one of the quickest and strongest poisons. If it can be demonstrated that alcohol accumulates carbon in the blood, it is eminently proper to classify alcohol with blood poisons.

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[1] Amer. Cycl. Art. Carbon.

The uninterrupted production of the necessary heat in the human body, by the slow combustion of oily or fatty substances, leaves a residue of carbon in the blood. This carbon waste is continually being carried to the lungs, where it comes in contact with the oxygen of the inhaled air, and is exhaled by the lungs as carbonic acid. Pure inspired air contains oxygen and no carbon. Expired air contains carbonic acid and no oxygen. The blood, before it goes to the lungs, is called dark or venous blood, because it is charged with carbon. When it comes from the lungs, it is red or oxygenized, because it is free from carbon, and charged with oxygen.

Alcohol, besides throwing its own carbon into the blood, lessens the normal amount of expired carbonic acid. Dr. Prout says, that "alcohol and all liquors containing it, have the remarkable power of diminishing the quantity of carbonic acid in the expired air."[1] Dr. Vierordt found, that in four experiments the per-

[1] Quoted in Effects of Alcohol, p. 108.

centage of carbonic acid in expired air fell, after from half to a whole bottle of wine had been taken, from 4.54 per cent to 4.01, and that this effect lasted from between one and two hours. He further found, that when he drank wine with his dinner, the usual increase in the percentage of carbonic acid expired after a full meal, did not take place.[1] Alcohol, therefore, accumulates carbon in the blood in two ways: negatively, by diminishing the normal quantity of expired carbonic acid, and positively, by unloading in the blood the carbon formed at the dissolution of alcohol into its component elements. When the amount of carbon in the blood increases until it reaches a certain degree of density, death ensues.

The immediate cause of death in suffocation, in asphyxia, and in fatal alcoholic poisoning, seems to be due to the accumulation of carbonic acid, and the absence of oxygen. In suffocation, the supply of oxygen is cut off; and, consequently, the blood becomes dark or carbonized. The

[1] Ibid.

carbon causes the purple hue which is assumed by the face of a suffocating person. The inhaling of a poisonous gas, such as carbonic acid, produces asphyxia, which means, a suspension of respiration. "The immediate baneful effects of the suspension of respiration arise from the privation of oxygen, and from the retention of carbonic acid previously formed, which becomes a blood poison."[1] Therefore, asphyxia is a species of suffocation.

In fatal alcoholic poisoning, death results likewise from carbonic acid poisoning. "The admixture of alcohol with the blood has a tendency to give a venous character even to that of the arteries; and when this tendency is augmented by imperfect respiration, the blood will become more and more venous, until its influence upon the medulla oblongata (basis of the brain) is so directly poisonous, that its functions are completely suspended, the respiratory movements are brought to a stand, and death takes place by asphyxia, precisely as in narcotic poi-

[1] Amer. Cycl. Art. Asphyxia.

soning by other substances."[1] Alcohol may be injurious without producing death by asphyxia or carbonic acid poisoning. Its destructive work may be slow and insidious. A minute quantity of any kind of poison must exercise a severe strain upon the normal healthfulness of those who habitually take it.

Some may claim that alcohol contains sufficient oxygen to eliminate its carbon, and that, therefore, alcohol does not accumulate carbon in the blood. This, however, is fallacious. Carbonic acid is the product of two parts of oxygen to one of carbon. Alcohol being composed of two parts of carbon, six of hydrogen, and one of oxygen, it is evident that the two parts of carbon require for elimination four parts of oxygen, or four times the amount contained in alcohol.

Water is the product of two parts of hydrogen, and one of oxygen. The hydrogen in the blood unites with oxygen, and produces water. It is evident, therefore, that the six parts of hydrogen in

[1] Effects of Alcohol, p. 36.

[illegible] contains five parts of carbon, twelve of hydrogen, and one of oxygen. The five parts of carbon require for elimination ten of oxygen; the twelve parts of hydrogen require six of oxygen. Ten and six are sixteen. Of the 16 of oxygen consumed by fusel oil 15 are furnished by the lungs, and 1 by the alcohol itself. Considering that oxygen is the vital element of inhaled air, and that the total privation of oxygen for a few minutes, causes death, it is certain that alcohol, by largely diminishing the normal amount of oxygen in the blood, must have a more or less deleterious effect upon the health of those who drink it habitually.

CHAPTER IV.

HOW ALCOHOL CARBONIZES THE BLOOD.

Function of the blood-globules in the oxygenation of the blood. How alcohol injures and disfigures the blood-globules. Normal amount of carbon exhaled in one day.

IF the claim that the habitual use of alcoholic beverage is more injurious than beneficial, is a reasonable one, it must, in time, revolutionize not only the drinking habits of entire nations, but modify the laws which now regulate the liquor traffic. An opinion of such magnitude must never be allowed to rest on theoretical principles alone. It must be submitted to the strongest possible test of experience and observation.

R. W. Richardson gives the following lucid explanation of the difficulty with which oxygen purifies the blood from carbon, when alcohol is present: "As the blood from the veins courses over the lungs, it gives up its carbonic acid gas, and in exchange for that gas, it receives oxygen gas from the air which we take in at each inspiration. In the blood there float millions of little round bodies, called blood globules, or blood-discs. They are so small that they can be seen only by means of the microscope. Their diameter is no more than the three thousand five hundredth part of an inch. This smallness is necessary for two grand purposes, at least. It is necessary in order to allow the corpuscules to pass easily through the minute blood-vessels of the body, and it is also necessary in order to expose a large surface of these globules to absorb the gases which it is their duty to carry. When the blood in the veins is floating towards the right side of the heart, which communicates with the lungs, it carries with it the carbonic acid; and, as I have found by experiment, a great part of this

gas is condensed in these little bodies, the blood-globules. Arrived at the lungs, the blood comes in such contact with the air we breathe at each breath we draw in, that the oxygen gas in the air is freely absorbed by the little globules, while the carbonic acid is given up into the air-passages of the lungs, and is thrown off by the breath with every breath we throw off. In this process, the blood changes in color. It came into the lungs of a dark color; it goes out of them a bright red. This red blood, which is charged with oxygen gas, is called arterial or oxygenated blood. . . . Under the influence of alcohol, the globules are reduced in size, and they are made so irregular in shape that it is almost impossible to recognize them so as to say to what class of animal they belong. . . . I found, by experiment, that even so minute a quantity as one part of alcohol in five hundred of blood, proved an obstacle to the perfect reception of oxygen by the blood."[1] "When alcohol

[1] Temperance Lesson Book, p. 119 to 136. New York, 1884.

is mingled with fresh arterial
darkens its color, so as to give
less of the venous aspect. A
this admixture is made under
scope, it is perceived that the re
shrink, and that a considerab
their contents becomes mingle
liquor sanguinis (liquor of the

It is absolutely certain, there
alcohol causes a shrinkage in
globules, which are thus rend
to absorb the normal amount
A want of oxygen invariably p
accumulation of carbon in the
cause the oxygen, as has been
the only available substance
change the carbon in the blood
bonic acid, and render it
Therefore, alcohol, by injuring
globules, lessens the absorpti
ygen, and accumulates carbo
blood.

The normal amount of car
inated from the blood is quite
able. "The respiratory proces

[1] Effects of Alcohol, p. 29.

hour carrying away, at least, one third of an ounce of carbon from the blood."[1] In twenty-four hours it amounts to eight ounces.

When alcohol, or any other cause, prevents the proper elimination of carbon, manifold derangements may ensue. Carbon in the blood plays an important part in the development of nearly every disease. So much alcohol has been consumed within the last hundred years, that it would not be surprising if the whole civilized race were suffering from a species of blood poisoning produced by the carbon of alcohol. Something must account for the recent physical deterioration of mankind.

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[1] Ibid, p. 99

CHAPTER V.

CARBON AS A CAUSE OF FEVER.

Fever is prevalent where the surface of the earth abounds in limestone and carbon. Magnesian limestone is a cause of goitre.

THE greatest achievements of medical science consist, not in the cure of disease, but in the prevention thereof. This applies, especially, to fevers. A febrile case once developed, cannot be cured. It runs its course ; and the most that a skillful physician may do is, to prevent further complications. But the time will come when all febrile diseases will be traced to their cause, and arrested in their origin.

Carbon as an essential factor in all feb-

rile diseases, has not yet received sufficient attention. If carbonic acid is the great and, perhaps, the only essential agent in the production of fever, it matters little whether the fever-producing carbon arises from limestone rock, or from coal exposed to the heat of the sun, or from decaying vegetable and animal matter, or from alcoholic beverages, or from several of these causes combined.

Science will yet demonstrate, that any poisonous agent which does not contain carbonic acid is incapable of producing fever. This truth, once established, will reveal to all civilized nations the fact, that the habitual use of alcoholic beverages, which carbonize the blood, add an incalculable force to the causality of all febrile diseases.

It is no difficult task to prove, that carbon is a cause of fever. The West India Islands are claimed to be the native soil of littoral and paludal fevers. The geological formation of these islands is coralline rock, which contains from 95 to 98 per cent of carbonate of lime. Coral rock is formed by the excess of carbon

carried into the ocean with the waters of rivers. Without such a process, the water of the ocean would, in time, lose its normal degree of purity. The partial decomposition of those coral or limestone rocks under the influence of air, heat, and moisture, charges the surrounding atmosphere with an excessive amount of carbonic acid.

The fact that the carbonic acid produced by coralline rocks co-exists with fevers in a locality, does not yet prove that one is the cause of the other. But the question assumes a different aspect when we find that certain specific diseases—especially fevers—prevail wherever limestone is exposed to air, moisture, and heat. Fever may be generated not only in low lands, but wherever the atmosphere contains an abnormal percentage of carbonic acid. In the Island of Trinidad, the ridge behind Port of Spain, which is a limestone rock 1,500 feet above the level of the sea, has been highly productive of yellow fever. The calcareous or chalky soil of Jamaica produces malarial poison as readily as any marsh in the United States. The carbon

separated from chalk or limestone by the action of moisture, heat, and air, unites with the oxygen of the atmosphere, and is transformed into carbonic acid.

Soft or rotten limestone is said to exist in many parts of the Mississippi Valley and in Florida. May not this soft limestone, by impregnating the water with carbon, and the atmosphere with carbonic acid, be the chief cause of yellow fever? Pennsylvania, which has a high death-rate from fevers, abounds in limestone. Gibraltar, which lies at the foot of a mountain composed of limestone and marble, is often and severely attacked by malarious fever. The same may be said of the Ionian Islands, which are composed of limestone mixed with sandstone and gypsum. It is not unreasonable to suppose that those parts of the Rocky Mountains where the so-called "mountain fever" prevails, contain much limestone near the surface.

The deaths from yellow fever at St. Thomas, an island of the West Indies, before it became a coaling depot for the British mail steamers, as compared with

the deaths afterwards, bear the proportion of 4 to 64.[1] In other words, since the storage of coal on the island, the number of deaths from yellow fever has become sixteen times larger. It has also been observed, that the combustible qualities of coal exposed to the weather of a tropical clime, become much deteriorated. The carbon which is extracted from coal by heated air, unites with the oxygen of the atmosphere, and produces carbonic acid.

The most patient researches have failed to detect an essential difference between one kind of fever and another. In hot climates, the carbon poison may absorb some additional deleterious substances changed into gaseous form by the action of heat. Carbonic acid seems to be the principal ingredient in all fever poisons. If the carbonic acid generated by swamps, rocks, or decaying matter, is such a powerful cause of fever, there is no reason why the carbonic acid generated in the blood

[1] Annals of Military and Naval Surgery. Quoted in Science and Practice of Medicine, vol. 1, p. 461.

by alcoholic beverages, should not be a fever poison.

Not only fever, but goitre and cretinism prevail wherever magnesian limestone abounds. At Cluses on the Arne, numerous cretins and goitrous persons are seen on the streets ; while lofty cliffs of mountain limestone tower over the town. In Yorkshire, Derbyshire, Nottingham, and Sussex, in England, there is a ridge of magnesian limestone ; and all along that line, goitre prevails to a great extent.[1] It is also found in the mountainous regions of Virginia, Pennsylvania, New York, New Hampshire, and Vermont. These states are rich in limestone.

Virchow's dissection of the heads of cretins, points to a premature union of skull bones by ossification, which is the direct cause of flat and undeveloped skulls.[2] It is very probable that carbonic acid and magnesia furnish the material or cement wherewith the bone-joints ossify prematurely.

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[1] Science and Practice of Medicine, vol. i, p. 790.

[2] Ibid, p. 794.

Some one has noticed, that flat skulls are very numerous among the criminal class. May not this be a kind of cretinism produced by the carbon of the alcoholic beverages consumed by such criminals or by their parents? The mysteries of the mischievous workings of alcohol will never be wholly unravelled. Still, enough light will yet be thrown on this important subject to show us conclusively, that the habitual use of alcoholic beverages aggravates the prevalence of fever, goitre, cretinism, and all other diseases produced by carbonic acid.

CHAPTER VI.

OPINIONS OF COMPETENT OBSERVERS.

Effects of alcohol in hot climes. Comparison between the mortality in abstaining and in non-abstaining English regiments in India. Dr. Macnish answered.

THE observations of scientific men, and of surgeons and officers of the English army in tropical climes, corroborate the theory, that alcoholic beverages facilitate the development of febrile diseases. "Whoever drinks stimulating liquors and travels day after day in the sun, will certainly suffer from headache; and in countries where miasmata prevail, he will be far more likely to be attacked by the diseases which are

there endemic."[1] Sir James Brooke, the colonizer of Borneo, speaks, in his *Journal*, of habitual abstinence from alcoholic liquors as "decidedly conducive to the maintenance of health, and of the powers of sustained exertion in the equatorial regions."[2]

In his work on tropical diseases, Dr. Mosely says: "I have ever found, from my own knowledge and custom as well as from the custom and observation of others, that those who drink nothing but water, or make it their principal drink, are but little affected by the climate, and can undergo the greatest fatigue without inconvenience."[3]

The following statement was made by an officer of the English army, to Carpenter, the author of *Effects of Alcohol:* "In the early part of 1847, the 84th regiment marched, by wings, from Madras to Secunderabad—a distance of between four and five hundred miles. They were

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[1] Gardiner's Travels in Brazil. Quoted in Effects of Alcohol, p. 115.

[2] Effects of Alcohol, p. 115. [3] Ibid, p. 116.

forty-seven days on the road; and during this period, the men were, practically speaking, teetotalers. Every morning when the tents were struck, a pint of hot coffee and a biscuit were ready for each man, instead of the daily morning dram which soldiers on the march in India invariably take. Half way on the day's march, the regiment halted, and another pint of coffee was ready for any man who wished it. The daily consumption of arrack for our wing was only two gallons and a few drams per diem, instead of twenty-seven gallons, which was the daily government allowance. The results of this water-system were shortly these: Although the road is proverbial for cholera and dysentery, and passes through several marshy and unhealthy districts, the men were free from sickness to an extent absolutely unprecedented in our marches in India. They had no cholera and no fever, and only two men were lost by dysentery, both of whom were old chronic cases taken from the hospital at Madras. The officers were surprised that the men marched infinitely better, with

less fatigue, and with fewer stragglers than they had ever before known, and it was noticed by every one, that the men were unusually cheerful and contented. That this remarkable result was not due to any peculiar healthfulness of the season, or other modifying circumstance, is shown by the fact that the 63rd regiment, which performed the same march, and at the very same time, though in the opposite direction, lost several men out of a strength of 400 ; and that it had so many sick, that when it met the 84th on its march, it was obliged to borrow from the latter the spare palanquins for the sick."[1] The annual rate of mortality in the 63rd and 84th regiments during their respective residence at Secunderabad, was 78.8 per 1.000 in the first, and 34.2 per 1.000 in the second, which enjoyed then the reputation of being one of the most temperate regiments in the European portion of the Indian army.[2]

Sir Charles Napier gave the following advice to the 96th regiment, when he re-

[1] Effects of Alcohol, p. 116. [2] Ibid, p. 117.

viewed it at Calcutta, on the 11th of May, 1849. "Let me tell you that you are come to a country where, if you drink, you are dead men. If you be sober and steady, you will get on well; but if you drink, you are done for. I knew two regiments in this country—one drank, the other didn't drink. The one that didn't drink is one of the finest regiments, and has got on as well as any regiment in existence. The one that did drink has been all but destroyed. I know that some men will drink, in spite of the devil and their officers; but such men will soon be in a hospital—and very few that go in, in this country, ever come out again."[1]

Statistical observations made in 1837 among British troops in India, gave the following result: The daily percentage of invalids among the members of Temperance societies, was 3.65, whilst for the remainder of the troops it was 10.20, or nearly three times as great.[2]

Some superficial observers claim, that alcohol is a preventive of fever. Dr.

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[1] Ibid, p. 118. [2] Ibid, p. 78.

Macnish, for instance, corroborates his views with the following vague assertions: "A British regiment quartered on the Niagara frontier in Upper Canada, in the year 1813, was prevented, by some accident, from receiving the usual supply of spirits; and in a very short time, more than two thirds of the men were on the sick-list from ague and dysentery."[1] It is not stated to what extent the men suffered from ague and dysentery before they were "prevented, by some accident, from receiving the usual supply of spirits." Those soldiers, like every one who habitually uses alcohol, must have become greatly depressed, if not mutinous, when they were suddenly, and against their will, deprived of the usual alcohol allowance. Such a morbid depression is extremely favorable to the development of febrile diseases.

Moreover, Dr. Macnish fails to inform us whether the "British regiment quartered or the Niagara frontier" received coffee or some other substitute for alcohol,

[1] Glascow Medical Journal, no. xv.

whilst the rum-wagon was struggling to reach them, or was, perhaps, being prematurely tapped by some fever-fearing and weary souls; or whether the men tasted naught else during the morning hours but the fresh dews of the Niagara river, or, worse yet, of the neighboring swamps. A good breakfast enables the human system to withstand the dampness of the morning fully as well as alcohol, without any of the deleterious results which may be produced by alcohol. If Dr. Macnish had felt competent to substantiate his statements in regard to the "regiment quartered on the Niagara frontier," he would have informed us how many men, if any, actually died during the enforced absence of the much-missed rum-wagon.

CHAPTER VII.

CARBONIC ACID AND FEVER POISON.

Why carbonic acid and fever poison are substantially alike. Their common properties. Both seem to be the product of fermentation and decay. In fever, carbonic acid forces the body into a state of transition from the animal to the vegetable life.

DECAYING vegetable and animal matter exposed to moisture and air, produces carbonic acid, which may, at times, be sufficiently abundant over the surface of partially dry swamps to burn with a flame, when ignited. Fever poison and swamp gas or carbonic acid have so many common properties, that

it is safe to conclude that they are substantially alike.

Fever poison, like carbonic acid, is absorbed by vegetation. Man rejects carbonic acid as a poison, and requires oxygen as the life-supporting principle. To plants, oxygen is poisonous, and carbonic acid, nutritious. People who live near swamps, yet so as to be separated from them by growing vegetation, are seldom attacked by fever. There are instances on record, where fever prevailed after the cutting down of trees near marshy districts. Yellow fever seems to become contagious towards the end of summer, when the powers of vegetation subside. Statistics may yet prove, that in May, June, and July, fever, in general, is less prevalent than at any other time of the year.

Fever poison, like carbonic acid, is absorbed by water. No fever poison can travel over a few thousand feet of water in the temperate zone. Sir Gilbert Blane cites an instance of this kind: "I had an opportunity," he says, "of observing (at Walcheren, in 1809) the extent to which noxious exhalations extended.

Not only the crews of the ships in the Road of Flushing were entirely free from the epidemic, but also the guard ships stationed in the narrow channel between the island and South Beveland. The width of this channel is about 6.000 feet; and, although some of the ships lay much nearer to the one shore than to the other, there was no instance of any of their officers or crew being taken ill with the same disorder (epidemic fever) as that with which the troops on shore were affected." When fever is contagious at Gibraltar, many of the inhabitants live a part of the time on boats, at a little distance from the shore. They thus remain free from fever. It seems that those who are exposed to fever poisons only at intervals, are seldom attacked by fever.

Fever poison, like carbonic acid, is most readily absorbed by water at 60° F. In tropical climes, fever poisons travel longer distances over water than in the temperate zone.

Fever poison, like carbonic acid, is closely allied with fermentation, vegetation, and the decaying process. The pro-

duction of carbonic acid is the principal chemical change produced by fever, fermentation, vegetation, and the decaying process. Fever may be nothing else but a process of fermentation.

It is true that fermentation is impossible without sugar, or starch converted into sugar. But, may not those substances of the body which have been built up by starchy or sugary food, and which are being rapidly consumed in fever, be changed back again into sugar or starch, and thus furnish sufficient material for fermentation? The aversion which all fever patients have for sugary or starchy nourishment, seems to corroborate the above theory.

Fermentation, vegetation, the process of decay, and fever, seem to be governed by the same laws of heat. An increase of heat is followed by a proportionate increase or greater intensity in the powers of fever poison, of fermentation, of vegetation, or of the decaying process.[1] The poisons which produce malarial fever

[1] Medic. Chir. Trans. vol, iii. p. 27

in the North, and yellow fever in the South, may differ only in intensity.

Fever, like fermentation, is a decaying process, which changes the human body from a predominantly oxygenous, into a predominantly carbonized substance. Carbonic acid is the life of vegetation, and the poison of animal life. Therefore, by the process of fever, which develops carbon, the human body is lowered from its normal standard of animal or oxygenous life, and is made to approach the vegetable or carbon world. As fermentation and decay prepare certain substances as food for vegetable life, so does fever, under similar circumstances of moisture and heat in the body, and by the same process of carbonization, lower its victims from the standard of animal life towards the vegetable or carbon life. When fever, which may be nothing else but an incipient stage of decay or putrefaction, has carbonized the body to a certain degree, death ensues. "In fatal cases of typhoid fever, gas has been observed to become developed during life, and has been detected in the veins at the root of the

neck, for some minutes before death."[1]

It seems evident that carbonic acid is an essential factor in fever poisons. It must, therefore, seem equally evident, that the habitual use of alcoholic beverages, which carbonize the blood, must add to the intensity of fever poisons, whilst the occasional or medicinal use of alcoholic beverages may have as little to do with the production of fever as an occasional exposure to malarious poison.

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[1] Med. Times. Quoted in Science and Practice of Medicine, vol. i, p. 386.

CHAPTER VIII.

CARBONIC ACID POISONING.

Fever, asphyxia, and delirium tremens are three stages of carbonic acid poisoning. If the symptoms and the medical treatment are identical in apparently distinct diseases, it is right to conclude that such diseases are identical.

THE fact that all fever patients show signs of carbonic acid poisoning, sufficiently proves that fever is intimately connected with the carbonization of the blood. That fever patients suffer from carbonic acid poisoning, is indicated by the method of medical treatment. The best remedies used in fevers are precisely those which are generally

used in carbonic acid poisoning or asphyxia.

Many of the symptoms in fever and in asphyxia are alike. In a patient who dies of cholera in the first, the asphyxiated, or pulseless stage, the lungs, upon examination, will be found collapsed on account of the more or less complete absence of air and blood; the right side of the heart filled; the left side and aorta empty, or containing only a small quantity of dark blood. These are exactly the post-mortem appearances in those who have died of asphyxia or carbonic acid poisoning. Before death, the entire surface of the body is blue, both in the pulseless stage of cholera and in asphyxia. The blue or dark color which is generally produced by other kinds of pestilential and virulent fevers, must be due to a sudden accumulation of carbonic acid in the body.

The headaches which usually accompany fevers, are due to the poisoning of the nerve-centers by carbonic acid. The same process of nerve poisoning produces headaches when we inhale the carbonic

acid which may have escaped from coal-fires, or from gas-pipes, and when we carbonize the blood by means of alcoholic beverages. As soon as the nerves become poisoned to a certain degree, the patients become languished, unconscious, and delirious, in asphyxia, in fever, and in alcoholism. In fever, in alcoholism, and, probably, in asphyxia, the perspiration is acid, because it is charged with a chemical product of carbonic acid.

The chief function of the lungs, in health and in disease, is, to inhale oxygen, and to exhale or remove carbonic acid from the system. In fever, in alcoholism, and in asphyxia, the respiration is more or less oppressed and accelerated, because a large quantity of carbonic acid has to be exhaled. In the three mentioned diseases, the lungs are overworked; and, therefore, prolonged fevers and alcoholism have a tendency to poison or to injure the lungs. It is well known that whooping cough, typhus, typhoid fever, measles, scarlet fever, and small pox are apt to produce bronchitis, pneumonia, or other pulmonary lesions. What is some-

times called "drunkard's cough," belongs to the same category of lung diseases caused by carbonic acid.

The methods of medical treatment are almost identical in fever, in alcoholism, and in asphyxia. Ammonia and other alkaline substances are specific remedies for the three diseases. "In the febrile state, the system ought to be supplied with an abundance of alkaline salt."[1] "Ammonia has been proposed as an antidote to several poisons, especially, alcohol, carbonic acid, and prussic acid."[2] "Recovery from delirium tremens may certainly be expected, if life can be sufficiently prolonged by warmth of the surface, by artificial respiration, and by the administration of ammonia."[3]

The oxygen of fresh air, when inhaled, absorbs carbon, and forms carbonic acid, which is exhaled. Water is composed of oxygen and hydrogen. Fresh air and water, on account of their carbon-

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[1] Science and Practice of Medicine, vol. i, p. 165.
[2] Amer. Cycl. Art. Ammonia.
[3] Effects of Alcohol, p. 37.

absorbing properties, are most salutary in fever, in asphyxia, and in delirium tremens. It is claimed, that yellow-fever patients have a better chance of recovery when nursed in the shade of trees, than in dwellings. The outside atmosphere contains more oxygen than the air in inhabited houses. "Persons rendered insensible by inhaling carbonic acid, may be restored by immediately dashing cold water over them."[1] Baths are most salutary in febrile diseases, when the patient is not too much exhausted. Baths must be also highly beneficial in cases of delirium tremens. The oxygen of the water probably extracts carbon from the pores of the skin, in asphyxia, in fever, and in delirium tremens. These three diseases may be three stages of the same disease—the carbonization of the human body. Asphyxia is a momentary poisoning of the lungs and blood with carbonic acid. It passes away as soon as the carbonic acid is sufficiently expelled to allow the blood to circulate. Delirium tremens

[1] Amer. Cycl. Art. Carbonic Acid.

is a general poisoning of the system with carbonic acid, derived from alcoholic beverages. It subsides as soon as the carbon is cast off through the lungs, the skin, and the kidneys. Fever is likewise a general poisoning of the system with carbonic acid, which, however, is not derived from any outside source, as in asphyxia and delirium tremens, but from some decomposing substances in the body. Fever means chemical changes and decay. The body is poisoned by its own decaying substance; and the carbonic acid poisoning in fever cannot be stopped until the decaying process is arrested.

Since carbon plays such a poisonous role in febrile diseases, it is evident that the habitual use of alcoholic beverages, which carbonize the blood, enters more or less into the causality of fever poisons.

Not only the crews of the ships in the Road of Flushing were entirely free from the epidemic, but also the guard ships stationed in the narrow channel between the island and South Beveland. The width of this channel is about 6.000 feet; and, although some of the ships lay much nearer to the one shore than to the other, there was no instance of any of their officers or crew being taken ill with the same disorder (epidemic fever) as that with which the troops on shore were affected." When fever is contagious at Gibraltar, many of the inhabitants live a part of the time on boats, at a little distance from the shore. They thus remain free from fever. It seems that those who are exposed to fever poisons only at intervals, are seldom attacked by fever.

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[1] Medic. Chir. Trans. vol, iii. p. 27

civilization. If so, they are woefully mistaken. They are pedantic intellectual imps and doting imbeciles, unworthy of this age, and deserving the utter contempt of all future generations.

True progressive science will not stop before prejudice, appetite, or a pampered public opinion. It will yet demonstrate, with mathematical precision, that alcohol has grown to be the greatest enemy of mankind. In a hundred years from now, public opinion will be changed. It will then look upon the habitual use of alcoholic beverages as a prolific cause of poorness of blood, nervous debility, and disease.

Science has a providential mission to perform. Scepticism, unbelief, and fatal divisions among Christians, thwart many attempts for the moral and physical amelioration of mankind. Science may take the initiative where revealed religion is paralyzed.

If the lamentable divisions among Christian nations are ever to be healed, it will be by means of some combined effort to ameliorate the condition of unfortu-

nate classes,—such as drunkards, lepers, or slaves. In this noble cause, all Christian nations may unite on purely scientific grounds. After having been united once more, and after having achieved great things by means of such a union, they may then conclude that it will be best to remain for ever united.

CHAPTER X.

ALCOHOL AND NUTRITION.

How alcohol impairs the nutritive qualities of the blood, produces an abnormal appetite for animal or nitrogenous food, and shortens the average duration of life.

THE element in the blood which supplies new fibrous substance to the different parts of the body, is called fibrine. It is plastic in its healthy state, and has a disposition to become organized. The habitual though moderate use of alcoholic beverages lessens the plasticity of fibrine, which is contained in the blood in proportion of two parts per thousand. It is owing to the presence of fibrine, that the blood is capable of coag-

ulating in wounds, or after it issues from the living body. When an animal has been killed by the injection of alcohol into the blood-vessels, the blood often remains fluid after death, or coagulates but imperfectly. Impaired solidifiability or plasticity of the fibrine, means impaired assimilating power of food.

It is generally conceded, that the incisions made by the surgeon's knife have a better chance to heal quickly and without inflammation and suppuration, in those who habitually abstain from alcoholic beverages, than in those who do not abstain. A strong assimilative power speedily supplies living organism in cuts or wounds; while inflammation and suppuration denote slow healing powers, want of organism, poorness of blood, and impaired nutrition.

Alcohol, which impairs the plasticity of fibrine, coagulates the soluble albumen which is contained in the blood in the proportion of about 75 parts per 1.000.[1] Alcohol, therefore, reverses the nutritive

[1] Amer. Cycl. Art. Albumen.

process of the blood, by liquefying fibrine, which ought to be plastic, and by solidifying albumen, which ought to be liquid.

Inflammation spreads easier in those who use alcoholic drinks than in those who do not use them. When any part of the body becomes inflamed, it is soon walled in, according to the order of nature, by what is called *plastic effusion.* This is a blood deposit made sticky by fibrine. It prevents the circulating blood from entering the inflamed part. In those who habitually use alcoholic beverages, the fibrine has little or no plasticity, which is a property of becoming solid; the blood is, therefore, less able to oppose a rampart to the poison of inflammation which is then quite free to spread through the tissues. "In such men, the slightest scratch or bruise will not unfrequently give rise to a fatal attack of erysipelas; and the internal organs affected with inflammation, rapidly become infiltrated with pus, or pass into a gangrenous state. Hence, the surgeon is very unwilling to perform severe operations upon

them, knowing that their chance of recovery is but small."[1]

Besides deteriorating the nutritive qualities of the blood, alcohol usually produces, in those who habitually use it, an aversion for about one half of the articles of food which may be used by man. The diet of those who have accustomed themselves to alcoholic drinks, consists principally of nitrogenous food; whilst they have little or no relish for farinaceous and sugary or carboniferous food.

It is natural that those who carbonize their bodies with alcohol, should loathe carboniferous food. Their dislike for carboniferous food increases in proportion as the nitrogenous elements in such food decrease. Their diet usually consists of the first few articles mentioned in the following table, because they contain much nitrogenous and little carboniferous food:—

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[1] Effects of Alcohol, p. 66

	Percentage of nitrogenous food.	Percentage of carboniferous food.	
Veal, White fish,	19	2.4	or 791
Skimmed cheese,	45	14.4	" 312
Poultry,	21	7.2	" 297
Salmon,	17	9.6	" 177
Beef and mutton,	19	12	" 158
Butter milk,	4.5	6	" 100
Eel,	10	19.2	" "
Beans,	24	47.4	" "
Vegetables,	2	5	" "
Peas,	22	62.8	" "
Human milk,	3.5	11.4	" "
Cow's milk,	4.5	14.8	" "
Yolk of eggs,	16	72	" "
White bread,	9	51.4	" "
Wheat flour,	11	74.8	" "
Rice,	7	76.7	" "

Starch contains only carboniferous food.[1]

If alcohol drinkers had nothing else to choose from but the last six articles mentioned in the above list, they would allow many hours to elapse before tasting much food. Among fruits, they select those which contain the least sugar, such as plums and currants ; the former con-

[1] Science and Practice of Medicine.

Parts of nitrogenous	to	100	of carboniferous	food.	
"	"	"	"	"	"
"	"	"	"	"	"
"	"	"	"	"	"
"	"	"	"	"	"
"	"	133	"	"	"
"	"	190	"	"	"
"	"	197	"	"	"
"	"	250	"	"	"
"	"	285	"	"	"
"	"	325	"	"	"
"	"	328	"	"	"
"	"	450	"	"	"
"	"	570	"	"	"
"	"	680	"	"	"
"	"	1.096	"	"	"

tain only 3 per cent, the latter 6 per cent of sugar.

In the normal state of health, man should use about six or seven times more carboniferous than nitrogenous food. Alcohol, which gives to those who habitually use it, a permanent dislike for carboniferous food, must, therefore, seriously interfere with nutrition.

Alcohol produces an aversion for carboniferous food not only by carbonizing the system, but also by not dissolving many nutritive substances, such as sugar and salt. Digestion dissolves food into its constituent elements ; therefore, alcohol hinders digestion in proportion as it prevents food from being dissolved.

It may yet be accurately ascertained to what extent alcohol, by rendering many articles of food indissoluble and, therefore, indigestible, and by creating an abnormal appetite for nitrogenous food, is a direct cause of dyspepsia, which is quite a prevalent disease in America. May not such a perverted digestive process be transmitted by an alcohol-drinking father to his totally-abstaining children ?

How often does alcohol cause rheumatism and gout, by polluting the blood with carbon, or by creating an abnormal appetite for animal or nitrogenous food ? The more these questions are fearlessly scrutinized, the more it becomes evident that alcohol has already allured the hu-

man race into a tangled path of ill-health and degeneracy.

Let those who need further proofs to be convinced that the habitual use of alcoholic beverages is more apt to shorten than to prolong the duration of life, scan the valuable statistics gathered by life insurance companies. "The average annual mortality in England for all ages between 15 and 70 years, is about 20 per 1.000. Among the lives insured by life insurance companies, it is about 11 per 1.000; whilst in the Temperance Provident Institution, after an experience of eight years, and with several lives above 70 years of age, the average mortality has been only 6 per 1.000."[1]

In 1889, one of the most influential mutual life insurance societies in the United States decided to reject all applicants for membership, who are employed in the sale of alcoholic beverages. "The directors of the Briton Life Association have felt themselves justified in reducing, by a sum of ten per

[1] Effects of Alcohol, p. 72.

cent annually, the premiums of all persons who have been total abstainers for two years."[1]

"From the annual report of the Soldiers' Total Abstinence Association for 1880, we find, that there are more than 9.000 abstaining soldiers in India. Several regiments have sent in returns as to the relative sickness and mortality among 2.118 abstainers, and 4.430 non-abstainers. From these returns we learn, that of the non-abstainers, the monthly averages per thousand were: admissions into hospital, 93; invalidated to the hills, 8.7; invalidated to England, 5.27; deaths, 1.45. Of the abstainers, the monthly averages per thousand were: admissions into hospital, 48; invalidated to the hills, 3.9; invalidated to England, 1.27; deaths, .37."[2]

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[1] Dr Ridge, in paper read at Bristol, Oct. 13, 1880.

[2] Temperance Lesson Book, p. 126.

CHAPTER XI

ALCOHOL IN THE LIVER.

The liver produces sugar. Alcohol prevents the formation of sugar, by changing albumen and fibrine. It interferes with the assimilation of sugar, because it does not dissolve sugar. Alcohol is, therefore, injurious in liver complaints and in diabetes.

THE liver is a sugar-producing organ; and it is the only organ of the body which, in the normal state, is found to be impregnated with sugar. Bernard, in France, established this fact, by observations on executed criminals, and on a large number of animals in almost every department of the zoological series. He found, that a healthy human

liver yields about 4 per cent of sugar. Furthermore, he found sugar in the blood extracted from the veins which carry the blood from the liver; but he found no sugar in the blood before it enters the liver. In its course from the liver to the lungs, the blood gradually loses its saccharine substance.

Alcohol seriously interferes with the starch or sugar-producing function of the liver, because it coagulates albumen, and destroys the solidifiability of fibrine. "During the transit of blood through the liver, 30 per cent of the albumen entering the liver, disappears in that organ."[1] "The blood, in passing through the liver, loses a great portion of its fibrine—a fact fully established by the observations of Simon, Lehmann, Bernard, and Brown-Séquard."[2] It is evident, therefore, that alcohol, in changing the normal condition of albumen by rendering it solid, and that of fibrine by robbing it of its quality

[1] Lehmann. Quoted in Science and Practice of Medicine, vol. ii. p. 139.

[2] Amer. Cycl. Art. Liver

to become solid or plastic, must seriously interfere with the function of the liver.

If alcohol did not interfere with the formation of sugar, it would nevertheless thwart the beneficent work of the liver, by rendering the sugary substance unfit to be assimilated, because alcohol does not dissolve sugar. Therefore, the presence of alcohol in the liver and in the blood hinders the process by which sugar is transformed into living tissue. It is certain that in the normal state of health, sugar is transformed into living tissue; because in diabetes, living tissue is transformed back again into sugar.

Alcohol, as an antiseptic which prevents sugar from being dissolved or assimilated, is one of the chief causes of diabetes. By the injection of alcohol and ether into the vein which conveys the blood to the liver, Dr. Harly was able to induce diabetes. Dr. Harly's observations may yet lead to the discovery of a general rule, that alcohol, and all other antiseptics, when present in the liver, interfere with the formation or assimilation

of saccharine substances. It is claimed that the internal use of quinine also produces saccharine urine. Quinine is a powerful antiseptic. In the proportion of one part to 800, it arrests instantly decomposition or fermentation in sugar. One part to 2.000 produces the same result in some minutes.[1] Diabetes may be nothing else but a failure to assimilate sugar on account of the presence of antiseptics.

The general opinion of physicians, that fat, starch, sugar, and alcohol should be avoided in diseases of the liver and in diabetes, is in perfect harmony with the above theory. When the liver is unable to produce animal starch or sugar, the consumption of sweet articles of food must aggravate the evil. Alcohol, in a sense, is equivalent to sugar, because it is invariably the product of sugar. Where sweet substances are injurious, alcohol also must be injurious. But alcohol, besides being an equivalent of sugar, is, moreover, an antiseptic. It

[1] Amer. Cycl. Art. Antiseptics.

must, therefore, be doubly injurious in diseases of the liver and in diabetes.

When alcohol regularly and seriously aggravates a disease, it is right to conclude that the habitual use of alcoholic beverages is one of the causes of such a disease.

CHAPTER XII.

ALCOHOL AND FATTY DEGENERATION.

Chemical affinity between fat and alcohol. Alcohol contributes to the formation of fatty degeneration, by its action on sugar and on the blood-globules, and by producing congestion in the capillaries.

WITH the limited knowledge we now possess in regard to the chemical process in animal nutrition, it is extremely difficult to define the exact relation between alcohol and fatty degeneration. Enough facts, however, may be gathered to warrant the conclusion, that alcohol is one of the principal causes which produce fatty degeneration.

Fatty substances are all composed of

carbon, hydrogen, and oxygen, to the exclusion of other chemical elements.[1] But alcohol, sugar, and starch are also composed of carbon, hydrogen, and oxygen, to the exclusion of other chemical elements. Therefore, the only difference between fat, alcohol, sugar, and starch, is a difference of proportion in their component elements, as the following table shows :

Alcohol: $C_2 H_6 O_0$
Cane sugar : $C_{12} H_{22} O_{11}$
Grape sugar : $C_6 H_{12} O_6$
Starch : $C_6 H_{10} O_5$

It is, therefore, evident that where sugar and starch are injurious, alcohol also must be injurious. Physicians generally direct, that those who suffer from fatty degeneration, should avoid fat, sugar, starch, and alcohol.

But alcohol is far more injurious in fatty degeneration than sugar, fat, or starch, because it may directly cause

[1] Amer. Cycl. Art. Adipose.

fatty degeneration by its action on albumen, on the blood-vessels, and on the blood-globules.

Fatty or waxy degeneration is usually termed amyloid. There is a strong similarity between amyloid and albumen, because both contain nearly the same amount of carbon, hydrogen, and oxygen. This similarity indicates that, in fatty degenerations, the nutritive process of transforming albumen into living tissue, is somewhere arrested, and results in the formation of an inferior and useless tissue, called amyloid. Alcohol solidifies albumen. Fatty degeneration, being almost wholly albuminous, may, therefore, be nothing else but a premature solidification of albumen by alcohol or other poisons.

Alcohol exercises a paralyzing effect on the nerves, and, consequently, on the walls of the blood-vessels, which are endowed with a regular net-work of fine nerves. "Some blood-vessels which are only large enough to allow one blood-globule—one three-thousandth of an inch in diameter—to pass through them, possess

the power of contraction."[1] This power of contraction possessed by the walls of the arteries, is weakened by the presence of alcohol. Consequently, too much blood passes through the veins; and hence, the flushed appearance of those who have taken even moderate quantities of alcohol. When the minute blood-vessels regain their normal strength and contracting power, they may fail to wholly expel the excessive blood. Some of the nutritive elements of the blood, such as albumen and fibrine, may adhere to the walls of the veins weakened and distended by alcohol, and lay the foundation for fatty degeneration or amyloid.

It is certain that alcohol contracts the blood-globules, and robs them of their roundness and smoothness. The impaired blood-globules may easily clot together when they are crowded into the distended and paralyzed veins, and choke up the latter. "In fatty degeneration, the coat of the artery becomes thickened and granular . . . and, at last, the artery

[1] Richardson's Brief Notes, p. 57.

looks like a compact, homogeneous, silvery cord or thread, of a clear and glassy appearance.'"[1]

The same author also states, that fatty degeneration of the liver is associated with the destruction of blood-globules.[2] Some day, science may demonstrate to us, that the blood-globules undergo destruction in all fatty degenerations. When the blood-globules, which absorb oxygen from inhaled air, are impaired or destroyed, the respiratory functions become more difficult and laborious, especially in crowded halls and churches, where the oxygen is rarefied. This may be the reason why the majority of those who for years have been occupied in the sale of alcoholic beverages,—if they go to church, usually attend such divine services which are of short duration. Alcohol, by injuring the blood-globules, and paralyzing the walls of the arteries, must, therefore, be highly favorable to the production of amyloid.

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[1] Science and Practice of Medicine, vol. i. p. 141.
[2] Ibid, vol. ii, p. 886.

In spite of the injury which alcohol does to the veins, nearly all those who use alcoholic beverages, possess the illusion, that alcohol benefits the circulation of the blood. It is true that it quickens the pulse ; but it cannot be beneficial on that account. Nobody claims that fever benefits the circulation because it accelerates the pulse. But it is easy to become sophisticated concerning things which are pleasing to the appetite. The most pathetic pleadings for strong drinks are but thin disguises in which human frailty tries to seek refuge. Many people find alcoholic potations connected with such alluring sensations, that the merest plausibility is sufficient to convince them that alcohol mitigates their ailments.

Dr. Parkes found, that taking 106.000 as the average number of beats of the heart in 24 hours, in a person supplied with water only as drink, the following increase in the beats of the heart within 24 hours was produced by alcohol :

From one fluid ounce of alcohol, the beats of the heart were 110.300.

From two fluid ounces, they were 114.-172.

From four fluid ounces, they were 118.-690.

From six fluid ounces, they were 124.-432.

From eight fluid ounces, they were 129.-904.

From eight fluid ounces, they were, on the following day, 131.488.[1]

Although alcohol increases the action of the heart, yet, in reality, it retards the motion of the blood, and thus, favors the formation of fatty sediments in the blood-vessels. "If we follow the course of alcoholic absorption through the vascular and pulmonary system, it is found unquestionably to retard the motion of the blood, while it produces a temporary increase in the action of the heart, and a congestion of the whole system of the pulmonary and capillary vessels. . . It is in cases of undoubted drunkenness that fats have occurred in the blood in an obvious quantity. In such cases, a milky

[1] Brief Notes, p. 59.

character is imparted to the serum—a condition which may be recognized by simple inspection, while microscopic examination and treatment with ether will establish the diagnosis, and distinguish the fat from colorless blood-globules, or from molecules of albumen."[1]

J. Frank regards the white and fatty blood as having its origin in the abuse of alcoholic drinks. Dr Adams mentions the case of a sergeant at Fort Williams, who went to bed drunk, and was found dead in the morning. The vessels of the brain were greatly distended with blood, and oil was seen floating in it.[2] Serules of Strasbourg records similar phenomena.[3]

The smallest veins are first affected by alcohol. This is the reason why the liver, the kidneys, and the brain, which contain an abundance of very minute blood-vessels, are usually the first organs to suffer from alcoholic congestion, paralysis, and fatty degeneration.

[1] Quoted from Hannoversche Annalen, 1847, p. 283.

[2] Quoted from Trans. Med. and Phys. Society of Calcutta.

[3] Science and Practice of Medicine, vol. i, p. 774.

CHAPTER XIII.

CLIMATIC INFLUENCES ON NERVOUSNESS AND INEBRIISM.

Alcohol, by vitiating the blood, injures the nerves, and causes insanity. It produces its most ravaging effects in those who are the most nervous. Why Americans are the most nervous people on earth.

THE veins lose their contracting power because alcohol, which has a strong affinity for nervous substances, paralyzes the nerves of the veins. The small nerves are first paralyzed by the alcoholic invasion. This paralysis of the nervous system spreads in proportion to the increase in the quantity of alcohol introduced into the blood. The nerves,

which are repeatedly paralyzed by the habitual use of alcoholic beverages, may, finally, suffer from permanent paralysis. This may account for the deadening of the finer sensibilities in many who habitually, though moderately, use alcoholic beverages.

By causing paralysis and fatty degeneration of the nerves, alcohol is a prolific cause of insanity. "According to statistics, out of 160 persons affected with progressive paralysis of the insane, 116 had the alcoholic association."[1] It has been explained, in the preceding chapter, how alcohol closes up the small blood-veins. The closing up of the small blood-veins may be a direct cause of degeneration and paralysis of the nerves. "The strangulation of the smaller blood-vessels induces failure in the proper nutrition of the nerve substance. Consequent upon this defect in nutrition, there ensue various forms of (nerve) cell degeneration."[2]

Before long, science may reveal to us a striking similarity between the blood of

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[1] Inebriism, p. 127 [2] Ibid, p. 131.

drunkards and that of the insane. "In (insane) patients who recover, the quality of their blood improves during residence in the asylum, and on discharge (of patients) is not much below the normal standard. . . The blood in the demented class of asylum patients is deficient in hemoglobin and in hematine."[1] Hematine forms a little over 1½ per cent of the substance of the blood-globules."[2] It has been demonstrated, that the blood-globules shrink under the influence of alcohol. The globules in the blood of the insane have lost a portion of their constituent elements. Therefore, the blood in insanity and in inebriism is vitiated in a similar manner.

Alcohol, by acting pre-eminently on the nerves and the brain, is more harmful in America than anywhere else on the globe, because we are the most nervous nation on earth. Those who claim that excessive business-cares constitute the

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[1] Dr. McPhail. Journal of Mental Science. Oct. 1886.

[2] Amer. Cycl. Art. Hematine.

chief cause of American nervousness, mistake the effect for the cause. Haste and overwork are rather the effect of nervousness than the cause thereof. The average American woman is quite free from business-cares. Her household occupations are generally less exhausting than those of her equals in other lands; and yet, she is endowed with her full share of nervousness. Much of what is being said about American nervousness is based on superficial observations.

The climate is the great cause of nervousness among us. The absence of inland seas and of high mountain-ranges may account for the unusually strong electric or magnetic currents in the atmosphere of this continent. Water intercepts or neutralizes electric currents. The north and the south shores of the European continent are bathed by inland seas. Its whole western front is exposed to the Atlantic. It is traversed by high mountain-ranges, many of which run eastward and westward. But this country presents an immense stretch of land over which electric and magnetic currents may sweep with-

out encountering large bodies of water, or high mountain-ranges running eastward and westward. In England, the mountains run mostly north and south. This may, to an extent, account for the different nervous dispositions in the Saxon and in the purely Latin races.

The most nervous nations are the most prone to drunkenness. There is more delirium tremens in England than in France—more in America than in England. Germany, which is less protected by mountains and oceans than France, seems to have drinking habits of its own. Already, St. Boniface, in the eighth century, wrote to St. Cuthbert, archbishop of Canterbury: "It is reported, that in your diocese the vice of drunkenness is too frequent... This is an evil peculiar to pagans and to our race (Saxons)."[1] But there is danger that the American people, being the most nervous nation on earth, and quite unprotected by oceans and mountains, may yet become the most drunken nation that ever was.

[1] Bridgett's Discipline of Drink, p. 77.

Delirium tremens is a fair index of the deleterious effects of drunkenness in a nation. Deaths from delirium tremens and from nervousness seem to be most numerous where mountains and oceans are scarce. If this is true, it follows, that alcoholic drinks and nervousness are more fatal in America than anywhere else.

Statistics showing the relation between delirium tremens and nervousness in different parts of the world, are lamentably incomplete. However, some information on the subject may be derived from a Report[1] of the annual mortality among British troops in different parts of the globe, from 1859 to 1862. It has the clumsiness to include delirium tremens among nervous diseases; but it indicates, nevertheless, that delirium tremens and nervousness are influenced by the same laws of climatology.

According to this Report, out of 11.79 deaths per 1.000 soldiers in Bermuda, 2.97 were caused by nervous diseases.

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[1] Science and Practice of Medicine. vol ii, p. 1.054 to 1.069.

The Report adds: "The diseases of the nerves are the most fatal, owing principally to the number of deaths from delirium tremens." "The land (on the Bermuda islands) is low, the highest elevation being that of Gibb's Hill, 180 feet high."[1]

In New Foundland, out of 6.72 deaths per 1.000 soldiers, 2.24 (about one third) were caused by nervous diseases. In the West Indies, out of 10.91 deaths, 2.25, and in Canada, out of 9.07 deaths, 1.09, were due to nervous diseases.

St. Helena has no forests and no mountains. Nothing but "a lofty ridge intersects the island."[2] Out of 9.11 deaths per 1.000 soldiers on that island, 217 (almost one fourth) were due to nervous diseases. The Report adds, that "intemperance prevails there to a great extent." It should not be forgotten why "nervous diseases are the most fatal." These Britishers—like the rest of mankind—are sometimes loath to confess their failings,

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[1] Amer. Cycl. Art. Bermudas.
[2] Amer. Cycl. Art. St. Helena.

or to allow the truth to appear in its plenitude.

New Zealand has very high mountain-ranges and dense forests. Out of 9.09 deaths per 1.000 soldiers, only 0.60 were due to nervous diseases. "Its coast climate is the most changeable and the most temperate in the world, the heat varying from 40° to 70°, and occasionally reaching both extremes in 24 hours."[1] This proves that sudden changes of temperature do not account for American nervousness.

In Gibraltar, out of 8. 86 deaths per 1.000 soldiers, only 0.23 were caused by nervous diseases. On the Ionian Islands, out of 9.16 deaths, 0.63—in Malta, out of 12.31 deaths, 0.56—and in Great Britain, out of 9.35 deaths, 0.68, were due to nervous diseases.

Australia has few high mountain-ranges ; and these run mostly north and south. Out of 13.24 deaths per 1.000 soldiers in that country, 2.13 were caused by nervous diseases.

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[1] Ibid, Art. New Zealand.

Forests are reservoirs of humidity, which check electric currents. America, since the destruction of its forests, is more exposed to electric currents than any other country in the world. It is, therefore, the most favorable field for nervousness, and for those disorders which may arise from the habitual use of alcoholic beverages.

The northern light (aurora borealis) which is frequently visible here, is a rare appearance in Europe. That streaming array of long, parallel, and gleaming darts, which denote electric or magnetic currents, is, probably, but a casual revelation of what continually goes on around us.

Under equal atmospheric conditions of cold, wind, and humidity, Americans are obliged to wear more clothing than Europeans. Owing to the presence of sharp currents, the atmosphere on this continent is really more "piercing" than elsewhere. These currents glide through our nervous system, especially, when we are not protected by woolen garments—which are bad conductors of electricity.

No substance in the human body is so easily affected by electricity as that of the nerves.

Mesmerism, which is the power to control another persons nervous system by means of electricity, is more flourishing in America than anywhere else. Rheumatism, which is, to an extent, a nervous derangement, and insanity are more prevalent here than in Europe.

It is a curious fact, that our dwelling-apartments must be warmer here than in Europe, in order to procure the same amount of comfort. It is hard to explain this differenee, unless we suppose that the nervous system in America is more active—even while apparently at rest—than in Europe, and that sharper currents continually tend to draw heat from our bodies. Bowditch, in the Fifth Report of the Massachusetts Board of Health, says, that "in the sitting-room, the air should not be above 72°, nor below 68°; 70, the medium, is the best." Surgeon D. L. Huntington, in reporting upon the Barnes Hospital of the Old Soldiers' Home at Washington, says, that "a pleas-

ant, even temperature of about 70° is maintained in the wards." A much lower degree of heat seems to be desired in European dwellings. The hall of the Crèche of St. Ambrose, Paris, has an average heat of 61°. In the schools of Vienna, 63° is regarded as the correct height of the thermometer. In 1870, an ordinance was passed for the schools in Wurtemburg, that their temperature should not exceed 68°, nor fall below 61°.[1]

We need more clothing more heat, and about 30 per cent more solid food, than Europeans. Our active nervous system, which spurs us on to work, produces much waste, and requires much food.[2] Alcohol, which interferes with digestion and with the nutritive process of the blood, must, therefore, be more injurious in America than elsewhere.

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[1] Cycl. of the Practice of Medicine, vol. xviii, p. 680.

[2] In an address to the Senate Post Office Committee, on Jan. 20, 1888, G. G. Hubbard stated, that "the American telegraph operator would send 2.500 words for every 800 words sent by the English operator using the Morse system."

The fact that we are the most nervous people on earth, need not alarm the learned Dr. Jewell, who says: "Civilization, as we find it at present, carries with it the causes or conditions of decay, or even of its final destruction; it is the nervous system which is to be the chief theater of the ruins with which the race is likely to be overthrown."[1] The average American is endowed with a strong, though active, nervous system, which may be easily maintained in its normal healthfulness, by supplying it with the proper amount of food, and by avoiding alcohol and all other substances which interfere with digestion and nutrition. Excitability and activity of the nerves do not necessarily mean nervous debility. An American is as apt as anybody else to have a strong nervous system as long as he possesses healthy digestive organs, and does not impair the nutritive qualities of the blood, by the habitual use of alcoholic beverages.

A healthy nervous activity in a people

[1] Journal of Mental and Nervous Diseases, vol. viii.

leads to the development or progress of civilization. It produces research and patient toil. It kindles enthusiasm not only in those who work for selfish motives, but also in those who devote their lives and energies to the welfare of others. The fact that Americans are the most nervous people on earth, is only another sign that Providence has destined America to be the theater of the highest progress attainable by mankind.

Whilst climatology and physiology clearly teach that the drinking habits of every foreign nation are more or less injurious to Americans, the latter had the weakness to allow the drinking habits of all nations to be imposed upon themselves. The mistake, however, was not quite willful; and it is, therefore, likely that it will yet be rectified.

With all the probabilities of a great future before us, it behooves us to listen with patient and scrutinizing attention to those who warn us against dangers, and tell us our faults with sincerity and reason.

It is a part of the highest wisdom to adopt the good qualities of any nation.

But there are three things which will be for ever incompatible with the welfare of America : The *Chinese opium habit*, the *drinking habits*, and the *Sunday desecration* of Europe.

CHAPTER XIV.

LESSON FROM THE INDIANS.

The Indian tribes may serve as mournful examples of the effect of alcohol upon animal life in America. Medicinal value of alcohol.

THE only way by which the Catholic Church in Canada was able to save some respectable remnants of the Indian tribes, was to impose upon them, for the last hundred years, the strictest abstinence from alcoholic beverages. If the white races of America should continue for the next two hundred years to give themselves to the habitual and excessive use of alcoholic beverages, they, too, will be doomed to a premature extinction; or, if they subsist, they will

deteriorate to such an extent that any band of adventures will soon be able to subjugate them.

There is a difference between a drunken American and a drunken European. The former seems to be more intensely drunk, and more violent and brutal, than the latter. But there is scarcely any difference between a drunken Indian and a drunken American white man. The only privilege which the white man in America may reasonably claim over the red man, in regard to the use of alcohol, is this; the former may use it for mechanical and medicinal purposes, whilst the latter should never approach near enough to it to inhale its odor.

Only those are apt to derive some benefit from alcoholic beverages, who do not use them habitually. Alcohol and all other drugs which are used constantly in health, have little, if any, curative power in sickness. Alcohol, as a drug, has a specific value. It contains more hydrogen, and, therefore, more heating properties than oil or fat. An alcohol-lamp heats more than an oil-lamp. In long-continued

fevers, when the supply of fat has been used up, and when the stomach refuses fat as well as other food, small doses of alcohol may produce sufficient heat to preserve life until the crisis is passed. But as long as fatty food can be digested, fat, as a heating substance, is far superior to alcohol, because the heat produced in the body by fat is steady and enduring, whilst the heat produced by alcohol is of short duration, and subsides suddenly.

In this country, alcoholic beverages should not be used in health. They should be used as drugs, having a specific value in certain diseases. This truth must be emphatically endorsed by an enlightened public opinion, if American liberties are to live, like the orange tree, in perennial bloom, and yield for the next eight or ten centuries, choicest fruits to a grateful, progressive, and appreciative people.

CHAPTER XV.

SHOULD STATESMEN BE INDIFFERENT TO ALCOHOLISM?

Opinions of leading men. Facts and statistics.

INTEMPERANCE is gradually looming up before moralists and law-makers as an evil which demands the most serious consideration. The laws that govern the germination of moral evils are similar to those that govern the production of physical diseases, which usually germinate insidiously, and are developed by stealth, until a sudden collapse makes them manifest to the physician. Intemperance, likewise, is undermining not only the moral, but also the physical vitality of the human family.

The alcohol question is gradually assuming an importance which will compel the combined intellectual forces of mankind to find a satisfactory solution. And if no practical solution will be furnished, some untoward circumstances, such as war or disease, will reveal a general collapse in more than one nation now included within the pale of civilization.

The most thoughtful men from all parts of the globe seem already to unite in a chorus of bitter lamentation against the ravages of alcohol. "Intemperance," says W. E. Gladstone, "inflicts more injury upon the world than war, pestilence, and famine."[1] The opinion of the Catholic bishops of Ireland cannot be classed among the exaggerations of enthusiasts. This is what they say in a Pastoral Letter: "To drunkenness we may refer, as to their baneful cause, almost all the crimes by which this country is disgraced, and much of the poverty from which it suffers. Drunkenness has

[1] Quoted in Archbishop Ireland's Intemperance and Law.

wrecked more homes once happy, than ever fell beneath the crowbar brigade in the worst days of eviction; it has filled more graves, and made more widows and orphans, than did the famine."[1]

Bishop Hendricken, of Providence, asserts, that "those helpless orphans (cared for in the Catholic orphan asylums of his diocese), in the far greater number of cases, are dependent upon alms, because saloons murdered their parents."[2] "In Suffolk County, Mass., it was ascertained, by a committee of good intelligent men, that eighty-four per cent of all crime committed in that county was due to intoxicating liquor."[3] The superintendent of the Bethel Associated Charities of Cleveland, reports, that during the year 1888 he had 1,542 applications from destitute persons for aid, and that intemperance had something to do with the destitute in fully 90 per cent of the cases.

The rapidly-multiplying methods for

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[1] Ibid. [2] Ibid.

[3] Sermon of Archbishop Ireland, in the prison at Stillwater, Minn.

producing pure alcohols have already cheapened and popularized intoxicating drinks to such an extent, that in the largest cities of the United States the number of saloons exceeds that of all kinds of provision stores combined. During the year 1882, the shops for the sale of liquor in New York city outnumbered those for the sale of food, by 2.278.[1] The American workingman needs more food, more clothing and more fuel than the European workingman. It is, therefore, eminently proper that our statesmen should favor such legislation which keeps wages in America above those in Europe. But why not solve the whole labor-difficulty from a temperance point of view, as suggested by Cardinal Manning and Terrence V. Powderly?

More than half of the Catholics, who, during the last four years, died in the almshouse of Buffalo, were killed by the direct or indirect effects of alcoholic excess. The saddest cases of deaths in that institution, during the same period,

[1] Intemperance and Law.

were those of young men ranging from twenty-five to thirty-five years of age, who had contracted diseases whilst sleeping on the ground in a drunken stupor. With squandered earnings and friends estranged, these dreary remnants of youth soon longed to be carted to a bed in the alms-house, where mute walls would shelter them during the last few days of their wasted lives, no less from the scorn of mankind than from the inclemency of the weather. But the tearful prayers of a faithful mother often obtain the grace of repentance and the consolations of religion for an erratic son, though she may never know on earth when or where he died.

Even Europe, in spite of its everlasting boast for "moderate habits," is developing a record of the fruits of drunkenness, which is not very far behind that of America. "According to the latest statistics of the German Empire, 42 per cent of all its crimes begins in drink. In murder cases, the percentage is 46, severe bodily injuries, 74 per cent, burglary, 54 per cent, and offenses against decency, 74 per cent. In

England, 74 per cent of the poor cared for by public funds, owe their poverty to this cause. In Geneva and Paris, the proportion rises to 80, and in Germany, to 90 per cent. It is known, moreover, that in nearly all civilized lands, from 20 to 40 per cent of the male insane, in the judgment of specialists, become so through drink. It should be noted, also, that a significant number of divorces—in Denmark 25 per cent—is due to the same cause; and of suicides, 30 per cent in England, and 40 per cent in Russia, result from intemperance."[1]

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[1] G. Bunge. The Alcohol Question. Translated from the German by Mary B. Willard.

CHAPTER XVI.

SECULAR AUTHORITY VERSUS DRUNKENNESS.

Why the secular power alone cannot suppress or prevent intemperance. Hints as to such changes in the law, which would afford much assistance to the friends of temperance.

THE secular authority can offer but a feeble resistance to drunkenness or any other vice by which the offender directly injures no one but himself. The criminal who has inflicted injury upon others, is justly prosecuted by those whom he has injured. The thief, when found, is prosecuted by those who have suffered from his depredations. The government prosecutes the murderer, in order to protect

a threatened community from further assaults. But where a criminal directly injures no second party by his vicious acts, there is no injured person to substantiate a complaint against him. Drunkenness as such, does not directly injure a second party, and is therefore not easily amenable to the civil authority. If a prosecution is to be instituted, it must rest on the complaint of friends and relatives, or on that of disinterested citizens, or on that of paid officials. It is unnatural that one friend, as such, should institute legal proceedings against another. If disinterested citizens make the complaint, they lay themselves open to the charge of maliciousness and other traits of the informer. And if paid officials are the complainants against a criminal who had injured no one but himself, they apparently assume the unpleasant role of salaried spies.

When the drunkard quarrels, or otherwise disturbs the peace, he may be punished by the civil law for having injured or threatened to injure others. When he is not only drunk, but, moreover, disorderly, it is easy enough to fasten the guilt

on him. But it is extremely difficult to prove the commission of a crime which has injured no one but the offender. The only human tribunals competent to deal with similar offenses are those before which the sinner is the principal if not the only accuser. Such tribunals are possible nowhere except in an ecclesiastical organization, which can scrutinize consciences.

If the secular power alone can offer but a feeble resistance to the vice of drunkenness, it should nevertheless give valuable assistance to any judicious effort to promote temperance, by *supervising the liquor traffic*, by *simplifying the mode of procedure* against drunkards, and by securing the *application of penalties* to convicted drunkards.

The only possible way to effectually supervise the liquor traffic is, to exact from distillers, brewers, and wholesale dealers, monthly or quarterly statements of customers and of amounts of liquor sold to each. The retail dealers should make specific reports of the amount of spirituous liquor sold, pay a license money proportionate to the value of liq-

uor bought, and be forbidden to keep the liquor in the same room or compartment where it is drunk. It should be the duty of inspectors of saloons to examine the above-mentioned reports, to seek out adulterated liquors, and to enforce the laws made for the regulation of the liquor traffic.[1]

Where the officers of the law are loath to arrest drunkards, a warrant should be issued for the immediate apprehension of a drunken person accused before a magistrate by the sworn statement of two citizens. When the accused is brought before the magistrate, the latter should then and there give a decision without further assistance from the witnesses. If the accused cannot be produced before the magistrate within two or three hours after the issuing of the warrant, the accusation should become void.

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[1] According to a chemist's report to Congress in Jan., 1888, many of the samples of beer analyzed by him, were found to contain sulphuric acid and salicylic acid. These acids absorb water. Is this, perhaps, the reason why beer drinkers often complain of an offensive dryness along the interior lining of the throat ?

Besides the penalty imposed upon drunkards, a fine should be assessed on the owners of railroads or other carriers who have conveyed a drunken person from one city or town to another. If a person convicted of drunkenness is not able to pay the fine imposed, such fine should be levied on the dealer or dealers who have sold or given liquor to that person on the day of conviction. If no guilty dealer can be found, the single fine should be imposed on the combined dealers of a city or town. This is the only practical way to secure that satisfaction which is invariably due to the law after a breach has been made manifest by judicial pronouncements. It would be within the boundaries of justice thus to compel the liquor dealers to contribute freely towards caring for those whom liquor has sent to penitentiaries, prisons, asylums, and almshouses.

It would greatly add to the stability of republican institutions, to disqualify from voting or giving evidence in courts of justice, for a limited time, those who have been convicted of drunkenness.

CHAPTER XVII.

THE CATHOLIC CHURCH VERSUS INTEMPERANCE.

Tactics of war in the Catholic Church. The decrees of her councils indicate how successful was her warfare against drunkenness in all nations and at all times.

THE ecclesiastical authority has been weakened by dissensions in Christendom to such an extent that, sometimes, it is but a feeble bulwark against the onslaught of human passions. All it can do in such instances is, to protest until the moral evils expire after, their angry course, from sheer exhaustion, as the furious waves of the ocean die with a splash upon reaching the sandy beach.

If the Catholic Church cannot always conquer, she can, at least, be invincible. Sometimes she allows Death and Time to demolish what she cannot vanquish. Some of her battles may go on steadily for centuries without material change in her plans and tactics. Her vitality is inexhaustible. A century is as one year in the natural term of her life on earth. After an existence of nearly nineteen centuries, she seems scarcely to have reached the full vigor of youth.

During seven centuries, she fought against slavery in Europe. She won. She has just begun to fight slavery out of the Dark Continent. She will succeed. Without her assistance, the combined forces which oppose socialism, would soon be routed in defeat. In nearly all parts of the civilized world she is engaged in a fierce struggle for her inalienable right to educate the young according to the eternal principles of morality and virtue.

With her unlimited resources, she ma simultaneously offer battle to many ferent kinds of enemies. Just as soo the leading minds in her vast and com

organization will realize the magnitude of the havoc which is being produced among the nations by the devastating power of alcohol, she will cheerfully offer to bear the brunt in the approaching battle against intemperance.

Happily, we have reached the time when it is needless, at least in America, to refute the old slander, that the Catholic Church foments drunkenness. As the thickest ice melts away when exposed to the persistent heat of the summer months, so the opaque clouds of prejudice must vanish before the benign influence of enlightenment. But it is very opportune to mention some of the extraordinary efforts which the Catholic Church has made, in times past to suppress intemperance.

APOSTOLICAL CANONS.

Canon 41.—"Any bishop, or priest, or deacon, addicted to gambling and drunkenness, must either cease or be deposed."[1]

Canon 42.—Any subdeacon, or reader,

[1] Hist. of the Councils, 5 vols., folio, Venice, 1585. Vol. i, p. 20.

or chanter, doing similar things, must either cease or be deprived of Communion. Likewise, also, the layman."[1]

Canon 53.—"If any cleric shall have been found eating or drinking in a tavern (caupona), let him be deprived of Communion, unless the necessities of travel may have compelled him to enter an inn (diversorium .

DECREE OF POPE EUTYCHIANUS.

The eighth of the ten decrees of Eutychianus, who became pope in 275, reads thus: "We command the Christians to guard themselves, by all means, against the great evil of drunkenness, from which all vices emanate (pullulant). We have therefore decreed, that he who should refuse to avoid this evil, must be excommunicated until satisfactory amendment shall have been made."[2]

The learned Bridgett claims, that drunkenness was treated too leniently during the first centuries of the Christian era, when he says: "But in the first ages, no special penalty seems to have been

[1] Ibid. [2] Ibid, p. 22. [3] Ibid, p. 481.

appointed for this crime (drunkenness) when committed by a layman. Intoxication might, of course, be a grievous sin, and he who was guilty would have to repent, to confess, and to do penance for it, as at presence ; but it was not one of the capital crimes for which specific and public penance was imposed. . . Hence, we find the early Fathers frequently complaining that the grievousness of habitual drunkenness was ill understood."[1] Excommunication, which was never considered as a *lenient* penalty, was inflicted on the layman "addicted to gambling and drunkenness." (Can. 41 and 42.) Pope Eutychianus, who inflicted the same penalty on drunkards who "refused to avoid this evil," must have looked upon drunkenness as *one of the capital crimes*, when he defined it as "a great evil from which all vices emanate."

COUNCIL OF LAODICEA.

This provincial council, which was held in 364, decreed, in its 24th canon,

[1] Discipline of Drink, p. 71.

that "those who are dedicated to the sacred ministry, from priests to deacons, and the remaining ecclesiastical orders, namely, subdeacons, lectors, chanters, exorcists, ostiaries, and those who intend to take vows of celibacy, shall not enter taverns."[1]

The Third Council of Carthage in 397, and that of Africa in 419, enacted similar decrees.

When, on account of the barbarism of the times, the Church had but little control over the laity, she exerted herself more than ever to raise her clergy to the high standard of virtue required in the clerical state. She knew that the only way to effectually reach a people strongly addicted to vice, was by means of an irreproachable body of priests. Hence her *apparent* neglect of the laity in some of her ancient laws.

She used the same tactics not only against intemperance, but also against other evils. Instead of taking seven centuries to drive slavery out of Europe, it

[1] Hist. of Councils, vol. i, p. 700.

would have been more expedient to oust it at once by enacting a general decree. But such an enactment would have fallen like a dead letter among the laity. For a long time the Church had to confine her anti-slavery laws to the limits of her sanctuaries. No one could be treated as a slave whilst he was under a clerical or monastic roof. Consequently, thousands of fugitive slaves permanently remained in monasteries, if their conduct was good.

COUNCIL OF VANNES.

The 13th decree of the Council of Vannes, which was held in 461, contains the following passage: "No one can be a competent master over his body and soul, who shows himself, whilst in the captivity of wine, a stranger to all sense, and allows himself to be led by the bent of his passions whilst the mind is defective; such a one generally runs the risk of committing sin or crime before he knows it. But this ignorance, which evidently flows from a willful insanity, does not excuse from guilt. Therefore we decree, that he who shall have

been found drunk, must be kept from Communion for the space of thirty days, or undergo a corporal punishment."[1]

THIRD COUNCIL OF TOURS IN 813.

Decree 48.—"The faithful must not follow drunkenness and surfeiting. The Lord, himself the author of Gospel-truth, said to his hearers: *Take heed to yourselves, lest perhaps your hearts be surcharged with surfeiting and drunkenness.*[2] Men, indeed, make little of these vices; but it is difficult to comprehend the magnitude of the evils which are usually generated by these vices. Physicians attest, that some of the more fatal diseases are caused by drunkenness. And it is not easy to estimate the ravages produced in the mind by drunkenness, which is the cause and origin of nearly all the acts which men commit rashly."[3]

The words spoken at Tours, over a thousand years ago, seem to describe, with an

[1] Ibid, vol. ii, p. 408. [2] St. Luke, ch xxi. v. 34.
[3] Hist. of Councils, vol. iii, p. 686.

astonishing precision, a condition of things quite common in our times. We, too, may truthfully say, that "some of the more fatal diseases are caused by drunkenness, . . . which is the cause and origin of nearly all the acts which men commit rashly."

COUNCIL OF MENTZ (MOGUNTIACUM) IN 813.

Decree 46.— "We command, that the great evil of drunkenness, from which all vices emanate, must by all means be guarded against; and we decree, that any one who should refuse to avoid it, must be excommunicated until satisfactory amendment shall have been made."[1]

INSTRUCTIONS OF THE BISHOP OF LINCOLN IN 1236

Robert Grossteste, Bishop of Lincoln, wrote to his archdeacons: "Because no one can succeed in subduing other vices, who has not controlled gluttony and drunkenness, we first of all strictly com-

[1] Ibid, p. 699.

mand that you prohibit in your synods and chapters those drinking assemblies which are commonly called scot-ales ;[1] and every year, in every church of your archdeaconries, this prohibition must be several times made known ; and if any presume to violate this prohibition, canonically made, you must admonish them canonically, and proceed against them by ecclesiastical censures."[2]

CONSTITUTION OF RATISBON.

This body of laws was promulgated in 1524 for the "reformation of the clergy of Germany."[3]

Decree 32.—"We also forbid both the clergy and the laity to dispute with temerity about the holy faith, especially around drinking-cups and at banquets, inculcating to priests that they should show great modesty, and particularly make it

[1] Scot-ales were a sort of pic-nics at which spirituous liquors were used to promote contributions towards charitable or other purposes.

[2] Quoted in Discipline of Drink, p. 173.

[3] Cardinal Campeggi, papal legate to Germany.

their business to read the Old and the New Testament.'"[1]

Perhaps, it will never be known to what extent the fumes of alcohol helped to produce that wild religious excitement which culminated in the bloodiest war that ever desolated Germany.

The mischievous influence of the tavern on momentous public questions, was not confined to the sixteenth century. The saloon-floor is a platform which few successful politicians can afford to repudiate. Our political deliberations will become unworthy of a free people, if they continue much longer to be held in an atmosphere contaminated with the acrimonious vaporings of alcohol.

Any national vice which has the clergy for its avowed enemy, is sure to succumb. It seems that the Catholic Church always aimed at conquering vice by setting her clergy in battle-array against it. By doing this she has repeatedly succeeded in freeing entire nations from drunkenness and other vices. What she has done in

[1] Hist. of Councils, vol. v, p. 210.

the past, she can do again. A temperance movement in America would undoubtedly be crowned with the highest attainable success, if it received the hearty cooperation of the Catholic clergy.

The Catholic Church will reap her full share of benefit from a successful temperance movement. If intemperance had not been the prevailing vice in America during the last forty years, the number of her members would now be increased by several millions, whilst her receipts for charitable and educational purposes would be more than doubled. Penal and eleemosynary institutions would not shelter the remnants of thousands of her families dismembered by alcohol. There is some reason why a large number of Catholic young ladies marry non-Catholics, or never marry at all; they have learned from their older sisters that the hope for something better beyond the grave is the only support to a woman who is doomed to physical and mental torture during the natural term of her husband's dissipated life. It is doubtful if a mother's fortitude and endurance can be put to a stronger

test than to be obliged to fight single-handed against starvation, whilst shielding her children from the brutalities of a drunken father. Such a woman hardly ever manifests her bitter anguish, except, perhaps, to a spiritual adviser, who can do little else for her than counsel patience and resignation. Her virtue and her sufferings are not known to the world. Even her own children, whom the sottish behavior of a drunken parent has prejudiced against all the surroundings of home, are soon eager to leave her. They gladly embrace the first opportunity to cast their lot among strangers.

The Catholic Church may justly boast of ever having been the friend of the oppressed. She cannot refuse to give her hearty support to a movement which is destined to deliver from misery a numerous class of virtuous mothers and their helpless infants—if it is not too late—if the demon of alcohol has not already buried its crooked harpy-claws into the vitals of society. The leading minds among the clergy and laity of the Catholic Church seem to grasp the situation. Her last

Plenary Council expressed the anxious wish, that all Catholics engaged in the liquor traffic should seek other occupations. The congress of her laymen, a few months ago, took a very advanced position against alcoholism. More than 40.000 men are enrolled in her temperance societies; whilst probably as many more of her male members are total abstainers without being affiliated with such organizations.

The friends of temperance are numerous; but they are not yet united. The self-respect fostered by American liberties is antagonistic to drunkenness. The king of creation, changed into a tottering sot, with lips which look like mere extensions of the salivary glands, presents an intensely sad and disgusting spectacle to the average American. Public opinion is decidedly opposed to the evils engendered by alcoholism; but there is a lack of concerted action. That reposeful placidity, which characterizes the most law-abiding portion of every commonwealth, is delaying the approach of a great temperance movement which cannot fail to be crowned with the highest success, if the leaders of

the cause possess a moderate amount of wisdom and temperate zeal, and if the Catholic Church continues to be, as she has been in the almost forgotten past, the deadly foe of intemperance.

FINIS.